

### **REMARKS**

Claim 14 is amended for consistency with claim 13 from which it depends. No new matter is added.

Claims 1-11, 13-15, 17-19 and 21-24 are rejected over newly cited art, all based on U.S. Patent No. 4,057,607 to Soehngen et al. In particular, the following rejections have been presented:

- Claims 1-10 under 35 U.S.C. §102(b) for anticipation by Soehngen.
- Claim 2 under 35 U.S.C. §103(a) for obviousness over Soehngen in view of U.S. Patent No. 4,973,439 to Chang et al.
- Claim 11 under 35 U.S.C. §103(a) for obviousness over Soehngen.
- Claims 8, 13-15, 21 and 22 under 35 U.S.C. §103(a) over Soehngen in view of U.S. Patent No. 5,856,508 to Jaffe et al.
- Claim 14 under 35 U.S.C. §103(a) for obviousness over the combined teachings of the Soehngen, Jaffe and Chang patents.
- Claims 17-19, 23 and 24 under 35 U.S.C. §103(a) over the combined teachings of the Soehngen, Jaffe and Chang patents.

Applicants respectfully traverse these rejections for the following reasons.

The present invention is directed to a process for extruding thermosetting powder coating compositions containing additives that are hard to incorporate into a base material including a resin and a curing agent. As set forth in para. [0008] of the specification, these "hard to incorporate additives" are additives that are not readily dispersed during an extrusion process. Examples include pigments, flow additives and components having a melting point higher than the (average) melting point of the resin(s) used in the base material. These additives would not include metal flake or other shear degradable particles, such as are the focus of the Soehngen patent.

The Soehngen patent is directed to a system for preparing shear degradable particle-containing resin powders. As shown in the drawing of the patent, a first composition containing resin and a curing agent is extruded through a melt screw extruder (6) and a second composition containing the shear degradable particles (metal flake) is added to the stream of resin exiting the melt screw extruder so that the metal flake is not subjected to the shear associated with the melt screw extruder. The mixture is then further mixed in a non-shear mixer (8) and solidified. The purpose of the system disclosed in the Soehngen patent is to prevent damage to the metal flake, which is incorporated into a resin powder.

#### Anticipation Rejections

Claim 1: The Examiner cites to a Comparative Example in col. 9 of the Soehngen patent that demonstrates the poor results of adding shear degradable particles (aluminum flake) to a melt screw extruder at a downstream position of the extruder. Aluminum flake is added to the extruder via a vent port (17) located before the extruder exit. Table III shows significant degradation of the aluminum flakes when they are added directly to the extruder at the vent port (17).

Apparently, the Examiner has equated the claimed "hard to incorporate additive" with the aluminum flake of the Soehngen patent added at a downstream position (at vent port 17). However, as defined in the present specification, the claimed "hard to incorporate additive" does not include metal flake or other shear degradable particles. Moreover, one skilled in the art would not consider shear degradable particles to be hard to incorporate into a resin composition. In fact, one skilled in the art would expect shear degradable particles to be easy to incorporate into resin. Claim 1 is therefore not anticipated by Soehngen because Soehngen does not disclose the claimed addition of hard to incorporate additives.

To the extent that the Soehngen patent discloses an addition of pigments and other conventional additives to the powder mixture, these additives are added either (1) to the first composition (the shear degradable mixture) that does not pass through an extruder as claimed or (2) at the extruder inlet to the second composition containing the resin and curing agent. Nowhere does the Soehngen

patent consider any need to add such additives at a position after the resin composition enters the extruder and before it exits the extruder as claimed.

In contrast, Applicants have discovered that adequate dispersion of such components in the extruder is achieved according to the present invention in which the additives are specifically added into the base material after the base material enters the extruder and before it exits the extruder. Therefore, Soehngen does not anticipate or render obvious claim 1.

Claim 2: Claim 2 includes a further element of step D) of **monitoring the output** of the extruder and **dynamically adjusting** the amount of the hard to incorporate additive added to the extruder, if needed, to dynamically control the manufactured thermosetting powder coating based on the monitored output. In rejecting claim 2 for anticipation by the Soehngen patent, the Examiner asserts that Soehngen teaches control of “the amount of additives employed in a continuous extrusion process” and that “[t]he additives are controlled/adjusted to produce a product of the desired color”. To the extent that the Soehngen patent considers the need to produce a particular color of powder, there is **no monitoring step** disclosed in the Soehngen patent and **no dynamic adjustment** of the amount of additives included in the powder. Accordingly, claim 2 and all of dependent claims 3-10 are not anticipated thereby.

#### Obviousness Rejections

Claim 2: As to the obviousness rejection of the subject matter of claim 2 based on the teachings of the Soehngen patent, in combination with the Chang patent, Applicants respectfully traverse this rejection. The Examiner acknowledges in the first paragraph on page 5 of the Office Action that the Soehngen patent is vague as to the specifics of the control (also indicating the lack of anticipation thereby), but asserts that a process control feature disclosed in the Chang patent would be obvious to include with the Soehngen patent “for the purpose of creating a high quality product”. The Soehngen patent is directed to a system for incorporating flake particles (shear degradable particles) into a resin mixture. Nothing in

Soehngen would motivate one skilled in the art to use process controls for controlling the amount of shear degradable particles or other additives.

To the extent that the Chang patent discloses a control system in an extrusion process, these teachings are inapplicable to those of the Soehngen patent. The Chang patent is directed to a process for preparing toner particles, which are mixed into a composition in an extrusion device. The output of the device includes a sensing head having electrodes that measure the conductance and capacitance values of toner particles included therein. The amount of toner particles is controlled based on the output of the sensor head. Chang relates to the production of a dispersion of toner particles, and its teachings are not even relevant to the teachings of the Soehngen patent regarding preparation of shear degradable particle-containing resin powders. As such, there is no motivation to combine these references in that the Soehngen patent contains no appreciation for the need to control the output of the resin powders produced therein in relation to the amount of additives and Chang only discloses process controls for manufacturing toner particles. Accordingly, claim 2 defines over the combined teachings of the Soehngen and Chang patents.

Claim 11: The Examiner asserts that it would be obvious to practice the method of claim 11 because the systems used for the injection step are obvious process parameters that have no impact on the practice of the claimed method. However, as detailed above, Soehngen fails to suggest the features of claim 1 from which claim 11 ultimately depends. Nothing in Soehngen suggests adding a **hard to incorporate additive** to an extruder at a position between the inlet and exit thereof. Soehngen's Comparative Example only demonstrates a problem with injecting shear degradable particles (such as aluminum flake) at a position upstream of an extruder exit. That teaching does not suggest controlling the injection point of hard to incorporate additives as presently claimed. Therefore, claim 11 defines over Soehngen.

Claims 8, 13-15, 21 and 22: In the rejection of claims 8, 13-15, 21 and 22 over the combined teachings of the Soehngen and Jaffe patents, the Examiner has relied upon a teaching in the Jaffe patent of pigments having a particle size of 0.5 to 4 micron.

As to claim 8, the Jaffe patent does not overcome the deficiencies of the Soehngen patent, which fails to teach or suggest the addition of hard to incorporate additives at a certain position of an extruder.

Claims 13-15 require the addition of at least one "hyperdispersed pigment" to the base material. The Examiner has equated the fluorescent pigments disclosed in the Jaffe patent (which may be sized 0.5 - 4  $\mu\text{m}$ ), with the "hyperdispersed pigment" recited in claim 13. As defined in the specification, a hyperdispersed pigment is a pigment that has been subjected to additional grinding in the dispersion steps, which results in a pigment having a particle size of 2 microns or less. The Examiner incorrectly states that the Applicants defined a "hyperdispersed pigment" as a pigment having an average particle size of 2 microns or less. Actually, a hyperdispersed pigment is defined in the specification as one which has been subjected to additional grinding and/or dispersion. The pigments disclosed in the Jaffe patent are **grown** to the sizes disclosed therein; they are **not ground and/or dispersed** to achieve a smaller particle size. A prior art reference that discloses a pigment having a particular particle size does not provide a motivation to modify the teachings of the Soehngen patent to add a hyperdispersed pigment as defined herein to a thermosetting powder coating composition produced in a melt screw extruder. Therefore, claims 13-15 define over the combined teachings of the Soehngen and Jaffe patents. Claims 21 and 22 further define the subject matter of claim 13 and define thereover for the same reasons.

Claim 14: As to claim 14, which requires monitoring the output from the extruder and dynamically adjusting the amount of hyperdispersed pigments added to the extruder based on the monitored output, Applicants have already established that the Soehngen and Chang patents do not suggest monitoring the output of an extruder of a thermosetting powder coating composition and adjusting

the amount of additive, which in claim 13 is hyperdispersed pigment(s). The Jaffe patent only teaches that pigments may be sized 0.5 - 4  $\mu\text{m}$ . That teaching alone with the limited teachings of Soehngen and Chang does not suggest the process of claim 14 wherein the output of an extruder of a thermosetting powder coating composition is monitored and the amount of hyperdispersed pigment(s) is adjusted dynamically to control the output. Accordingly, claim 14 defines over the cited references.

Claims 17-19, 23 and 24: Claim 17 is directed to a process for dynamic color control in a thermosetting powder coating extrusion process. The Examiner has again applied the Soehngen, Chang and Jaffe references for this rejection of claims 17-19, 23 and 24. The Examiner asserts that in the Soehngen process, "the amount of pigment employed is implicitly determined controlled, monitored and adjusted to produce a product of the desired color". None of the sections of Soehngen cited by the Examiner relate at all to the production of a particular color with dynamic control, much less any monitoring of the output. In addition, claim 17 requires the use of a hyperdispersed pigment and dynamic control of the addition of the pigments to the thermosetting composition. As pointed out above, none of these features are taught or suggested by any of the Soehngen, Jaffe or Chang patents. Therefore, claims 17-19, 23 and 24 define thereover.

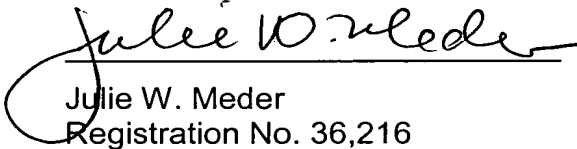
Claims 1-11, 13-15, 17-19 and 21-24 define over the prior art of record and are believed to be in condition for allowance. Favorable consideration thereof is respectfully requested.

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